

3/18/97

ECOLOGICAL EFFECTS BRANCH REVIEW

Chemical: Myclobutanil (Rally 40W)

100 Submission Purpose and Label Information100.1 Submission Purpose and Pesticide Use

The Hawaii Department of Pesticide Regulation has applied for an emergency exemption for Rally 40W (myclobutanil) fungicide to control powdery mildew on watermelons. This problem was first noticed in June of 1995. It is determined to be a new resistant strain. No new data were submitted for this request.

100.2 Formulation Information

Myclobutanil:a-butyl-a-(4-chlorophenyl)-1H-1,2,4-triazole-1-propane-nitrile. 40%
Inert Ingredients 60%

100.3 Application Methods, Directions, Rates (from label)

Applications should begin at first sign of disease development and continue on a 7 to 10 day schedule. Application rate is 4 oz product (0.1 lb ai) per acre. Users are limited to 6 applications per season. Applications may be made by ground. All applicable directions, restrictions and precautions on the EPA registered label are to be followed.

100.4 Target Organisms

Powdery mildew, (Sphaerotheca fuliginea)

100.5 Precautionary LabelingProduct Label

For terrestrial uses, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters. Do not apply when weather conditions favor drift or runoff from areas treated.

101 Hazard Assessment101.1 Discussion

The proposed exemption would allow use of myclobutanil on 1,000 acres of watermelons in the following counties: Hawaii, Maui, Oahu, and Kauai. Exemption period is April, 1997 through April 1998.

101.2 Likelihood of Adverse Effects on Nontarget OrganismsEnvironmental Fate Data:

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- Stable to hydrolysis at pH 5, 7, and 9
- Stable to photolysis in water
- Photolytic soil half-life = 143 days
- Aerobic soil half-life = 66 days
- Anaerobic soil half-life = no degradation at 62 days
- solubility = 142 ppm
- Leaching: myclobutanil is moderately mobile ($K_{ds} = 1.46 - 9.77$ for adsorption and $0.47 - 4.18$ for desorption in 5 soils). $K_{oc} = 112$. The degradate is considered highly mobile.
- Bioaccumulation: Fish bioaccumulation study was waived. Myclobutanil is not expected to bioaccumulate.

The major route of dissipation is believed to be diffusion and dilution; myclobutanil appears to be resistant to most environmental breakdown processes.

Toxicity Data Terrestrial Species

BIRDS: Ecological effects avian toxicity data for myclobutanil are as follows:

Species	Study Type	% a.i.	Results	Status
Bobwhite	Acute oral LD ₅₀	84.5	510 mg/kg	Core
Bobwhite	Dietary LC ₅₀	84.5	>5000 ppm	Core
Mallard	Dietary LC ₅₀	84.5	>5000 ppm	Core
Bobwhite	Reproduction	94.2	NOEC=260ppm	Supplemental
Mallard	Reproduction	94.2	NOEC=260ppm	Supplemental

Myclobutanil is slightly toxic to birds on an acute basis, and practically non-toxic to birds on a sub-acute (dietary) basis.

MAMMALS: Mammalian toxicity data for myclobutanil is as follows:

Species	Test type	% a.i.	Results	Status
rat	acute oral	91.9	LD ₅₀ =1360 g/kg	core
rat	2-gen. repro.	84.5	Repro NOEL = 200 ppm, LOEL = 1000 ppm	core

rat	2-gen repro.	84.5	systemic NOEL = 50 ppm, LOEL = 200 ppm	core
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Myclobutanil is slightly toxic to mammals on an acute basis.

Aquatic Species

Aquatic toxicity data for myclobutanil is as follows:

Species	Test type	% a.i.	Results	Status
Bluegill sunfish	96-hr acute	84.5	LC ₅₀ =2.4 ppm	core
Rainbow trout	96-hr acute	84.5	LC ₅₀ =4.2 ppm	core
Daphnid	48-hr acute	84.5	EC ₅₀ = 11 ppm	core
Sheepshead minnow	96-hr acute	93	LC ₅₀ = 4.7 ppm	core
Eastern oyster	96-hr acute	93	EC ₅₀ = 0.68 ppm	supplemental
Mysid	96-hr acute	93	LC ₅₀ =0.24 ppm	core
Fathead minnow	Early life stage		NOEC = 0.98 ppm, LOEC = 2.2 ppm	supplemental

Myclobutanil is moderately toxic to freshwater fish and invertebrates, moderately toxic to marine fish, and highly toxic to marine invertebrates on an acute basis.

Exposure Data and Risk Quotients (RQs)

Acute terrestrial exposure estimates were made using the Kenaga nomograph. Values were derived based on the maximum label rate per acre per application (0.1 lb a.i./A). Values were also calculated for 6 applications at 0.1 lb ai/A on a 7-day application interval using the FATE program. Values presented below are the maximum estimated residues for various vegetation types. RQ values were derived by dividing the estimated exposure by the LC₅₀ value. RQs greater than 0.5 exceed the Agency's Level-of-Concern (LOC) for high risk; values greater than 0.2 indicate a risk which may be reduced if mitigation measures are instituted; values greater than 0.1

exceed the LOC for endangered species.

Chronic risk was assessed using the residues generated by the FATE program and comparing them to the available avian reproduction data. An RQ greater than 1 exceeds the Agency's LOC for high risk. The printout for the FATE program is attached at the end of this review.

Vegetation Type	Max. Kenaga value (0.1 lb ai/A)	Acute RQ	Max. FATE EEC (6 appl., total of 0.6 lb ai/A)	Chronic RQ
Short Grass	24 ppm	0.005	119 ppm	0.458
Long Grass	11 ppm	0.002		
Leaves/leafy crops	12.5 ppm	0.003		
Forage/Insects	5.8 ppm	0.001		

There were no LOC exceedances for avian species from the proposed use of myclobutanil. This use is not expected to cause concern for avian species.

Terrestrial Species-Mammals

Acute: Based on acute LD₅₀ values, mammals are less sensitive than birds to myclobutanil. Since acute risk to birds is not expected from the proposed use of myclobutanil, acute risk to mammals is not expected.

Chronic: Maximum residues calculated via the FATE program are lower than reproductive NOECs for mammalian species. Therefore, reproductive risk is not expected for the proposed use of myclobutanil.

Aquatic Organisms

Exposure estimates (EECs) and RQs

The aquatic EECs presented below were generated using the GENEEC computer program developed by EFGWB. This program uses a variety of environmental fate parameters in conjunction with the application rate to estimate the exposure to aquatic organisms from runoff. The maximum total application rate (0.6 lb a.i./A) was used in this program, since little degradation would occur during the 7-day application interval for multiple applications. The printout from this program is attached at the end of this review.

Acute RQs were derived by dividing the instantaneous EEC by the LC or EC₅₀ value for each species. The Agency's LOC for high-risk is exceeded if the RQ value is greater than 0.5. Values of 0.2 and higher indicate risk that may be reduced if mitigation measures are instituted, and values greater than 0.05 exceed the LOC for endangered species.

Chronic RQs were derived by dividing the appropriate EEC by

the NOEC obtained in chronic tests. The 21-day EEC is used for aquatic invertebrates, and the 56-day EEC is used for fish (using the early life-stage NOEC). Note that there is no acceptable chronic data available for invertebrates, so the chronic invertebrate RQ could not be generated for this risk assessment.

	EEC (ppb)	RQ
Instantaneous	24.1	Bluegill: 0.01 Trout: 0.01 Daphnid: 0.00 Shpsht. minnow: 0.01 Oyster: 0.04 Mysid: 0.10 ¹
56-day	18.8	Fathead minnow: 0.02

Exceeds the endangered species LOC

No high-risk LOCs were exceeded for the proposed use of myclobutanil. The mysid RQ exceeds the LOC for endangered species; however, as there are no endangered species of marine/estuarine invertebrates, this is not a concern.

Plants

Tier II Testing

Terrestrial

Tier II terrestrial plant testing is unavailable for myclobutanil.

Aquatic

Tier II aquatic plant data is available for *Selenastrum capricornutum* only. The *Selenastrum* EC₅₀ value is 0.83 ppm. No adverse effects to aquatic plants are expected, based on this value.

Discussion of RQs/LOC exceedance

A. Effects on terrestrial organisms:

Acute

Based on the acute toxicity data, myclobutanil does not appear to pose an acute risk to avian or mammalian species from the proposed use.

Chronic

The proposed use of myclobutanil does not appear to pose a reproductive concern to birds or mammals.

B. Effects on aquatic organisms:

Acute

Fish: Based on the acute toxicity data, myclobutanil should not pose an acute concern to freshwater or marine/estuarine fish from the proposed use.

Invertebrates: The endangered species LOC was exceeded for

marine/estuarine invertebrates; however, exposure to this class of organisms is not expected from the proposed use. The proposed use of myclobutanil does not pose an acute concern to freshwater aquatic invertebrates.

Chronic

Fish: The proposed use of myclobutanil does not appear to pose a chronic risk to fish.

Invertebrates: Chronic risk to aquatic invertebrates could not be assessed at the present time due to a lack of data.

C. Effects on plants:

Terrestrial: A risk assessment for terrestrial plants could not be completed at this time due to a lack of data.

Aquatic: Based on the single aquatic plant species for which data was available, the proposed use of myclobutanil does not appear to pose a risk to aquatic plants.

101.3 Endangered Species Considerations

Risk to endangered species is not expected from the proposed use.

101.4 Adequacy of Toxicity Data

The available data were adequate to complete a risk assessment for this particular use.

101.5 Adequacy of Labeling

Environmental hazards labeling is adequate for use under this exemption.

102 Conclusions

EEB has reviewed the proposed emergency exemption for the use of myclobutanil on watermelons in Hawaii. The use of myclobutanil as proposed is not expected to present risk to any nontarget organisms, including endangered species.

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DAILY ACCUMULATED PESTICIDE RESIDUES---MULTP. APPL.

Chemical name ----- Myclobutanil
Initial concentration (ppm) ----- 24
Half-life ----- 61
A number of application ----- 6
Application interval ----- 7
Length of simulation (day) ----- 50

DAY	RESIDUE (PPM)		
0	24		
1	23.72883		
2	23.46073		
3	23.19565		
4	22.93357		
5	22.67445		
6	22.41825		
7	46.16496		
8	45.64335		
9	45.12763		
10	44.61775		
11	44.11363		
12	43.6152		
13	43.1224		
14	66.63517	44	107.5441
15	65.88227	45	106.329
16	65.13789	46	105.1276
17	64.40191	47	103.9398
18	63.67425	48	102.7654
19	62.95481	49	101.6043
20	62.2435	50	100.4562
21	85.54022	Maximum residue	----- 119.1244
22	84.57372	Average residue	----- 77.53551
23	83.61815		
24	82.67336		
25	81.73926		
26	80.81571		
27	79.90259		
28	102.9998		
29	101.836		
30	100.6854		
31	99.54778		
32	98.42302		
33	97.31097		
34	96.21146		
35	119.1244		
36	117.7784		
37	116.4477		
38	115.132		
39	113.8311		
40	112.545		
41	111.2734		
42	110.0161		
43	108.7731		

RUN No. 1 FOR myclobutanil INPUT VALUES

RATE (#/AC) ONE (MULT)	APPLICATIONS NO.-INTERVAL	SOIL KOC	SOLUBILITY (PPM)	% SPRAY DRIFT	INCRP DEPTH (IN)
.100 (.600)	6 7	112.0	142.0	5.0	.0

FIELD AND STANDARD POND HALFLIFE VALUES (DAYS)

METABOLIC (FIELD)	DAYS UNTIL RAIN/RUNOFF	HYDROLYSIS (POND)	PHOTOLYSIS (POND-EFF)	METABOLIC (POND)	COMBINED (POND)
.00	0	90.00	90.00-11043.00	.00	89.27

GENERIC EECs (IN PPB)

PEAK GEEC	AVERAGE 4 DAY GEEC	AVERAGE 21 DAY GEEC	AVERAGE 56 DAY GEEC
24.14	23.80	21.95	18.84